



MAPPING KEY ROLE PLAYERS AND SETA PARTNERSHIPS: A DESIGN AND METHODOLOGY TO GUIDE RESEARCH ON SKILLS DEVELOPMENT SYSTEMS

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LABOUR MARKET
INTELLIGENCE PARTNERSHIP



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LIST OF ABBREVIATIONS AND ACRONYMS

AET	adult education and training	SKA	Square Kilometre Array
AgriSETA	Agricultural Sector Education and Training Authority	SMME	small, medium and micro-sized enterprise
AIDC	Automotive Industry Development Centre	SSI	sectoral system of innovation
AIEC	Automotive Industry Export Council	SSP	sector skills plan
APDP	Automotive Production and Development Programme	TVET	technical and vocational education and training
CDC	Coega Development Corporation	UIL	university-industry linkage
DHET	Department of Higher Education and Training	WBE	workplace-based experience
dti	Department of Trade and Industry	WIL	work-integrated learning
E&T	education and training	WSP	workplace skills plan
ECPSDF	Eastern Cape Provincial Skills Development Forum	WSU	Walter Sisulu University
ECSA	Engineering Council of South Africa		
ECSECC	Eastern Cape Socio-Economic Consultative Council		
ELIDZ	East London Industrial Development Zone		
FET	further education and training		
HET	higher education and training		
HRDS	Human Resource Development Strategy		
HSRC	Human Sciences Research Council		
IPAP	Industrial Policy Action Plan		
LMIP	Labour Market Intelligence Partnership		
merSETA	Manufacturing, Engineering and Related Services SETA		
MNC	multinational corporation		
NAACAM	National Association of Automotive Component and Allied Manufacturers		
NAAMSA	National Association of Automobile Manufacturers of South Africa		
NDP	National Development Plan		
NGP	New Growth Path		
NMMU	Nelson Mandela Metropolitan University		
NSDS	National Skills Development Strategy		
NUMSA	National Union of Metalworkers of South Africa		
PMI	Production Management Institute		
PSET	post-school education and training		
QCTO	Quality Council for Trades and Occupations		
SAQA	South African Qualifications Authority		
SDA	Skills Development Act		
SETA	sector education and training authority		

PREFACE

In 2012, the Department of Higher Education and Training (DHET) commissioned the Human Sciences Research Council (HSRC) to lead a national research consortium, *the Labour Market Intelligence Partnership (LMIP)*, to support it in creating a strategic labour market intelligence system.

This research guide is based on an LMIP project: *A study of labour market interactive capabilities, structures and mechanisms in diverse post-school education and training institutional settings*. The study investigated ways in which the alignment between public and private education and training providers, and firms and labour markets, can be improved. The researchers designed a framework and a set of instruments for collecting and analysing data on organisational capabilities and interaction in skills development net-works. It used these to analyse practices within three sectoral systems: sugarcane growing and milling in Kwa-Zulu Natal, automotive components manufacturing in the Eastern Cape, and astronomy, specifically the Square Kilometre Array big-science project.

A key finding is that intermediary organisations, such as the Sector Education and Training Authorities (SETAs), play a crucial role in supporting alignment between employers' skills needs and skills supply-side organisations. They facilitate partnerships and networks, and build organisational capabilities.

In a changing policy landscape, however, SETAs are challenged to improve their performance as intermediaries (see DHET

2013). New regulatory instruments require that they work more closely with key stakeholders, such as TVET colleges and firms, and facilitate interaction among them to identify and articulate skills needs and build capabilities to meet skills needs. SETAs are also challenged to build their own capabilities to conduct high quality research, so that they produce more consistent and reliable data and intelligence to inform effective strategies.

This spurred a process of engagement between the LMIP researchers, the DHET's SETA task team and individual SETA managers, to identify ways in which the research templates could be packaged for wider use.

The LMIP team thus offer this research guide, as one set of tools SETAs can use to inform their strategies around partnership. The guide aims to assist SETA activities to fulfil their mandatory roles. SETAs can use the guide to conduct their own research, to provide sectoral and local evidence to inform their skills planning processes.

February 2016

SECTION

1

Introduction

This research guide aims to share a set of tools that SETAs can use to build their capabilities to conduct research that informs their skills planning processes. It introduces a new framework, design and methodology that can yield evidence that complements and adds to the quantitative data traditionally used for skills planning. Research using this guide will produce in-depth evidence to inform building of the partnerships and networks that are so critical to successful skills development.

Who this research guide is for

The research guide is intended to inform the practice of SETA skills planning and strategy development. It focuses on how research can be conducted to inform a SETAs' Sector Skills Plan (SSP). Conducting research in this way can also be useful to inform the implementation of structured institutional innovations, such as a Lead SETA Office in a TVET College. Research evidence can be gathered to strengthen partnerships between TVET Colleges, employers and SETAs.

The Department of Higher Education and Training (DHET) has developed a new Sector Skills Plan framework (2015 SSP framework) that provides a detailed outline and minimum requirements for credible skills planning at the sectoral level. The 2015 SSP framework focuses on gathering and analysing data to support SETAs' key roles in aligning education and training supply side with employers' demand for skills in their sector, that is, their **intermediary roles**. SETAs are required to strengthen their research capacity, to improve their Sector Skills Plans in-line with the new framework.

The research guide provides tools to assist **SETA skills and strategic planners** in their task. Specifically, the guide provides tools to:

- describe the state of existing skills development partnerships of SETAs, employers, and education and training providers;
- identify types of partnerships missing from existing skills development systems;
- monitor existing partnerships in skills development systems.

How to use this research guide

The research guide has two overall purposes:

- To introduce a bottom-up, systemic approach to sectoral skills planning and development, one that captures the dynamics and complexities of 'skills development realities'.
- To equip SETA skills and strategic planners and research staff with a conceptual framework, practical guidelines and instruments for analysing and monitoring SETA partnerships and partnerships among key role-players in skills development systems.

Each section of the research guide has been designed to build on the previous one, moving from high-level ideas to very practical steps to gather and analyse data.

The guide describes:

- **a bottom-up approach to skills planning and development based on an innovation systems framework** and describes the **facilitative or**

intermediary roles of SETAs in skills development systems (Section 2)

- **how to identify the main actors** and analyse the roles of key role-players in a sector or sub-sector/constituency (Section 3)
- **how to collect and analyse data on SETA partnerships** to identify key partnerships and missing partnerships, and to monitor existing partnerships (Section 4).

Supporting information and resources are included in the Appendix (Section 5).

Key terms and concepts

Table 1 provides a summary of the key terms and concepts used in this document. It is a useful glossary that can be referred to repeatedly in each section of the guide.

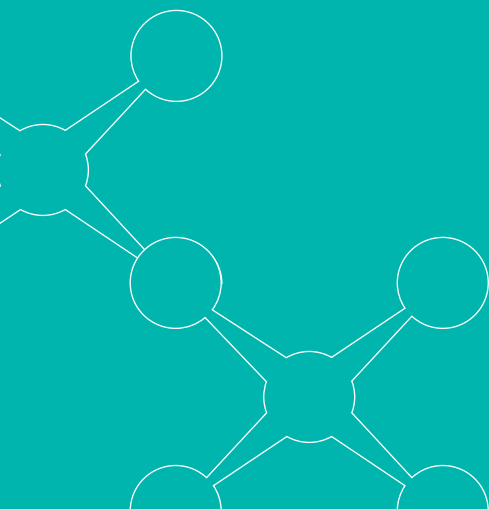
Table 1: Summary of key terms and concepts	
Sectoral system of innovation	'Sets of actors organised around specific types of productive activities and technologies' (e.g. sugar-cane milling) within distinct geographical (e.g. in KwaZulu-Natal) and institutional settings (e.g. policy) ¹
Competencies	The pre-set attributes of firms (and individuals), including expertise, human resources, organisational routines and structures, technologies, formal policies or other physical resources ²
Interactive capabilities	The capacity to form effective linkages with other organisations and use existing competencies to learn through interaction ³
Dynamic interactive capabilities	The capacity to sense changes in the environment relevant to the organisation and respond effectively and timeously through strategic management
Institutions	Rules or guides for behaviour, in respect of which the following can be distinguished: formal (e.g. national policy) and informal (e.g. organisational culture); binding (e.g. specific regulations) and created by interaction (e.g. contracts); and national (e.g. patent system) and sectoral (e.g. sectoral labour markets)
Social skill	The ability to form linkages, work in a team and 'induce cooperation among actors in an organisation or any other field' ⁴
Post-school education and training (PSET) organisations	A diverse set of private and public education and training organisations, i.e. universities, universities of technology, TVET organisations, private colleges, private higher education institutions, and other training providers (e.g. public and private adult education and training (AET) institutions, training centres operated by industry associations, etc.)
Sectoral intermediaries	Organisations in SSIs that facilitate interaction, translate and facilitate information flows, ⁵ and offer services (e.g. training) that are not easily available in the system but which are essential
Private intermediaries	Sectoral intermediaries that tend to focus more on industry- or firm-specific issues
Public intermediaries	Sectoral intermediaries that tend to focus on public-good objectives, especially those related to policy
Actors	Participants or stakeholders in skills development systems; these could include individuals, organisations, or units within organisations

1/ Malerba (2005). 2/ Von Tunzelmann & Wang (2003, 2007 in Iammarino 2009). 3/ Von Tunzelmann & Wang (2003, 2007 in Iammarino 2009). 4/ Fligstein & McAdam (2012: 46). 5/ Van Lente et al. (2003: 248).

SECTION

2

A framework to analyse dynamic skills demand and supply



The research tools provided in this guide are based on a framework that captures the dynamics and complexities of skills development systems. It recognises the need to go beyond numbers in order to develop targeted interventions for skills planning and development. Different types of employer – whether small, medium or large, or non-profit, and whether in resource-based, manufacturing or services sectors – respond in different ways to global and local shifts, new technologies and new knowledge. Similarly, post-school education and training (PSET) organisations, in producing skills, respond in diverse ways to government policy and skills demand. An understanding of skills demand and supply has to take these factors into account if it is to reflect ‘skills development realities’.

Explaining the framework

We propose a **sectoral system of innovation (SSI)** framework that emphasises **interaction and alignment** between the **needs and capabilities** of the different types of stakeholder in skills development systems – firms, government departments and agencies, post-school education and training providers, trade unions, research organisations, industry associations, and so on. The approach is dynamic and emphasises change over time, but also how history shapes what is possible. In this research guide, the focus is on developing SETAs’ **‘interactive capabilities’**, that is, the capacity to form effective partnerships and learn through interaction.⁶ A good example

of interactive capabilities is the subsector committees of sector education and training authorities (SETAs) (e.g. AgriSETA’s Sugar Subcommittee, merSETA’s Automotive Chamber) that serve as forums for key employers, unions and industry associations to meet in order to discuss general issues and challenges they may face. The committees are potentially useful mechanisms for facilitating interaction among the range of stakeholders in the skills development system.

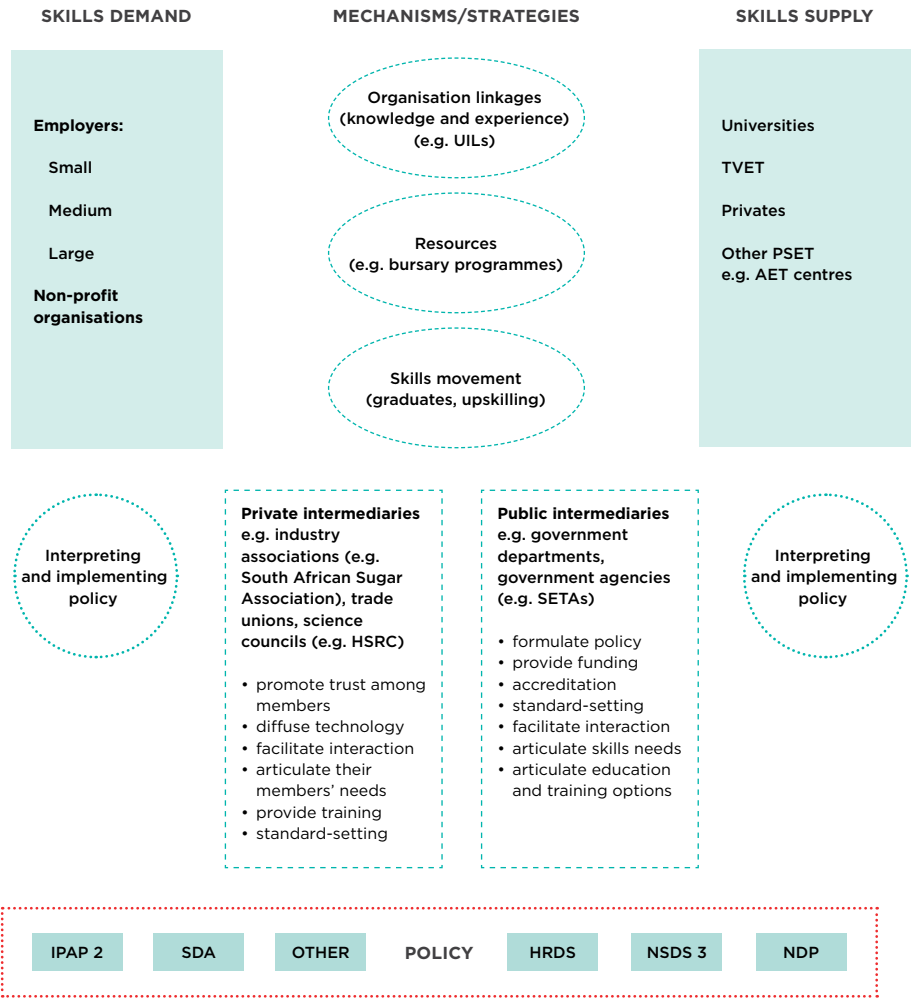
The SSI framework is useful for informing the work of SETAs because it considers the differences between sectors in terms of their knowledge bases, skills needs and conditions, rather than focusing on industrial concentration. Within the SSI framework, a sector is defined as ‘a set of activities which are unified by some related *product groups* for a given or emerging demand and which *share some basic knowledge*’.⁷ So, for example, the actors within the subsectors/sectors governed by merSETA share a focus on metals and engineering-related product groups, and they share a knowledge base of engineering and other technological processes that all those who work in the sector will need to acquire. While the framework emphasises activities at the sector level, it considers the influence of stakeholders at the national and regional levels (e.g. national and provincial government).

Figure 1 provides a generic representation of the actors and interactive capabilities in an SSI in the South African context.

⁶ See Von Tunzelmann & Wang (2003, 2007 in Iammarino 2009).

⁷ Malerba (2005: 65).

Figure 1: SSI framework for analysing skills development systems, foregrounding the role of intermediaries



SECTION 2 A framework to analyse dynamic skills demand and supply

It highlights the need to **outline or map the existing structure, the key role players, and the mechanisms/strategies used in skills development networks.**

This research guide provides step-by-step guidelines and instruments for undertaking this kind of mapping.

On the left-hand side, we describe the relative size of groups of employers operating on the demand side, whether small, medium or large, or not-for-profit, including formal and informal entities such as smallholders. Each group is likely to have distinctive skills needs. The framework highlights the need to investigate, with a view to improving skills planning strategies and skills development interventions, the **strategies and mechanisms** that employers use for meeting their **routine and changing skills needs**. Such an analysis may provide signals as to how education and training organisations, in their role as supply-side actors, can and do play a role in addressing skills needs.

On the right-hand side, we analyse the different types of PSET organisations that could be addressing skills demand in a sector – whether public technical and vocational education and training (TVET) colleges, universities or universities of technology, private TVET colleges, private higher education and training (HET) providers, adult education and training (AET) providers, or other skills development programmes such as those involving apprenticeships, learnerships, work-integrated learning (WIL) or workplace-based experience (WBE). According to this framework, apprenticeship, learnership, WIL and

WBE programmes are identified as mechanisms for interaction.

The circles in the middle of the diagram represent examples of the typical mechanisms and strategies used to link supply and demand. For example, there may be flows of financial resources whereby firms provide scholarships and bursary programmes to meet their future skills requirements. Varying degrees of direct involvement are possible; these could include knowledge flows as well. For instance, a firm may host artisans or college students for workplace training, or university or college lecturers could work in a firm to update their experience. Hence, different types of partnerships, such as ‘firm–university’ partnerships for the purpose of WIL and ‘SETA–TVET college’ partnerships, are identified as mechanisms for interaction in this framework.

Between the left- and the right-hand sides, we identify the intermediary organisations that serve to connect employers and PSET organisations and align their goals. In the public sector, intermediary organisations include government departments, agencies like the South African Qualifications Authority (SAQA) or the Quality Council for Trades and Occupations (QCTO) and, critically, the SETAs and their facilitative and coordinating roles. In the private sector, intermediary organisations include industry associations (e.g. the South African Cane Growers’ Association), professional bodies (e.g. the Engineering Council of South Africa (ECSA)), research institutes, and so on.

Each of the actors is embedded in broader institutional environments that shape, and are shaped by, their activities. Hence, **at the very bottom of the diagram**, we include examples of the main global, national or regional policy mechanisms that could be shaping demand in a sector or influencing education and training supply. Firms, PSET organisations and intermediary organisations interpret policy and, depending on their interactive capabilities and strategic goals, respond in different ways and to varying degrees.

The role of SETAs: Intermediaries in a sectoral skills development system

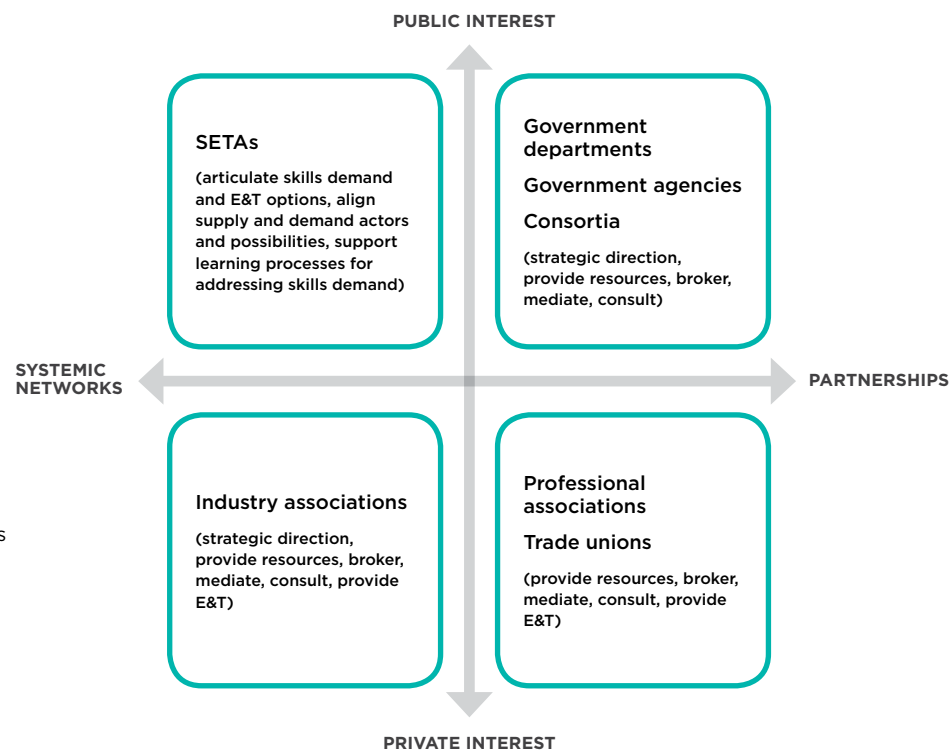
SETAs are mandated to perform intermediary roles in skills development systems. Intermediary roles include:

- Connecting firms, education and training providers, government and other stakeholders;
- Facilitating information flows among stakeholders; and
- Offering essential services that are not readily available in a system (e.g. training, accreditation for short courses, etc.).

Figure 2 on page 6 shows four groups that play intermediary roles in skills development systems, based on the LMIP case study research. Industry associations, for example, connect firms so that they can work together to serve their interests more effectively. Government departments, in contrast, may provide strategic policy direction and resources for the public good. Professional associations and trade unions also play an intermediary role in serving the private interests of their members.

SETAs have an advantage in that they have access to top-down and bottom-up labour market intelligence; hence they have the potential to provide a 'rich understanding of skills priorities'. They also work closely with both public- and private-sector actors. SETAs are thus expected to facilitate and coordinate skills development across public and private interests, as well as to bridge the skills demand and supply sides. In order to carry out their mandate, SETAs should therefore operate at the network level (i.e. coordinate skills development across groups or networks of actors such as universities, firms, TVET colleges, etc.), articulating skills demand, identifying education and training options for meeting demand, facilitating interaction between supply- and demand-side actors, and supporting learning processes for addressing skills needs. It is thus critical for SETAs to understand who their existing partners are, and how they interact within a skills development system. A list of partners serves only as the starting point.

Figure 2: SETAs as intermediaries in skills development



SECTION 3

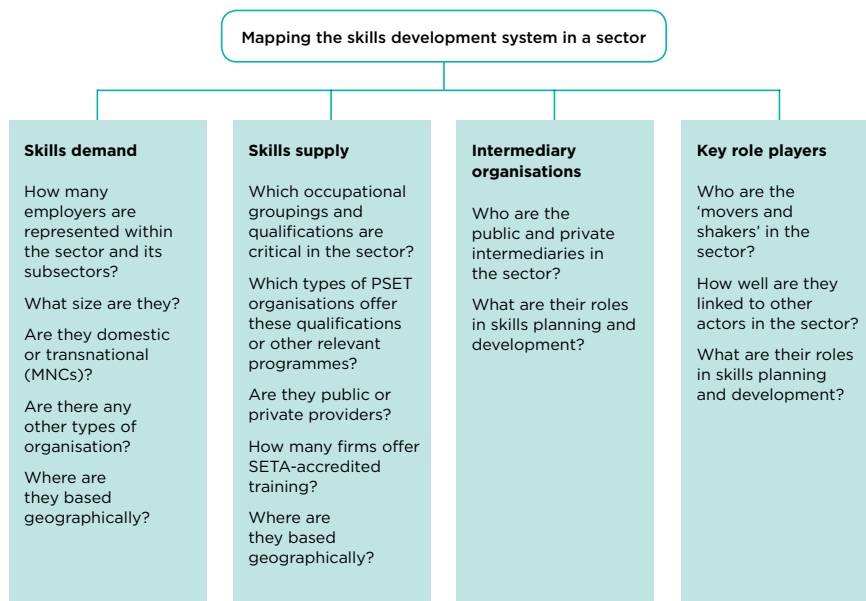
Mapping the actors in a sectoral skills development system

How can sector education and training authorities (SETAs) identify key role players and develop detailed maps of the main actors in a sector?

An important part of developing a sector profile is identifying the main actors in the sector. The new sector skills plan (SSP) framework stipulates that the sector profile should include an analysis of the major role players in the sector rather than simply presenting a list of the actors. In this Section 3, we therefore provide a step-by-step guide to how to collect the necessary data and how to conduct such an analysis. Figure 3 suggests key research questions for

mapping the main actors in a skills development system. Some of the research questions have been borrowed from the new SSP framework. A step-by-step guide for the mapping and for presenting an analysis of key role players is provided. An example of a completed map of actors is included in Appendix 1. We recommend an analysis at the subsector/constituency level first before proceeding to describe the skills development system at the sector level.

Figure 3: Outline for mapping the skills development system in a sector



Source: Adapted from DHET (2015: 28)

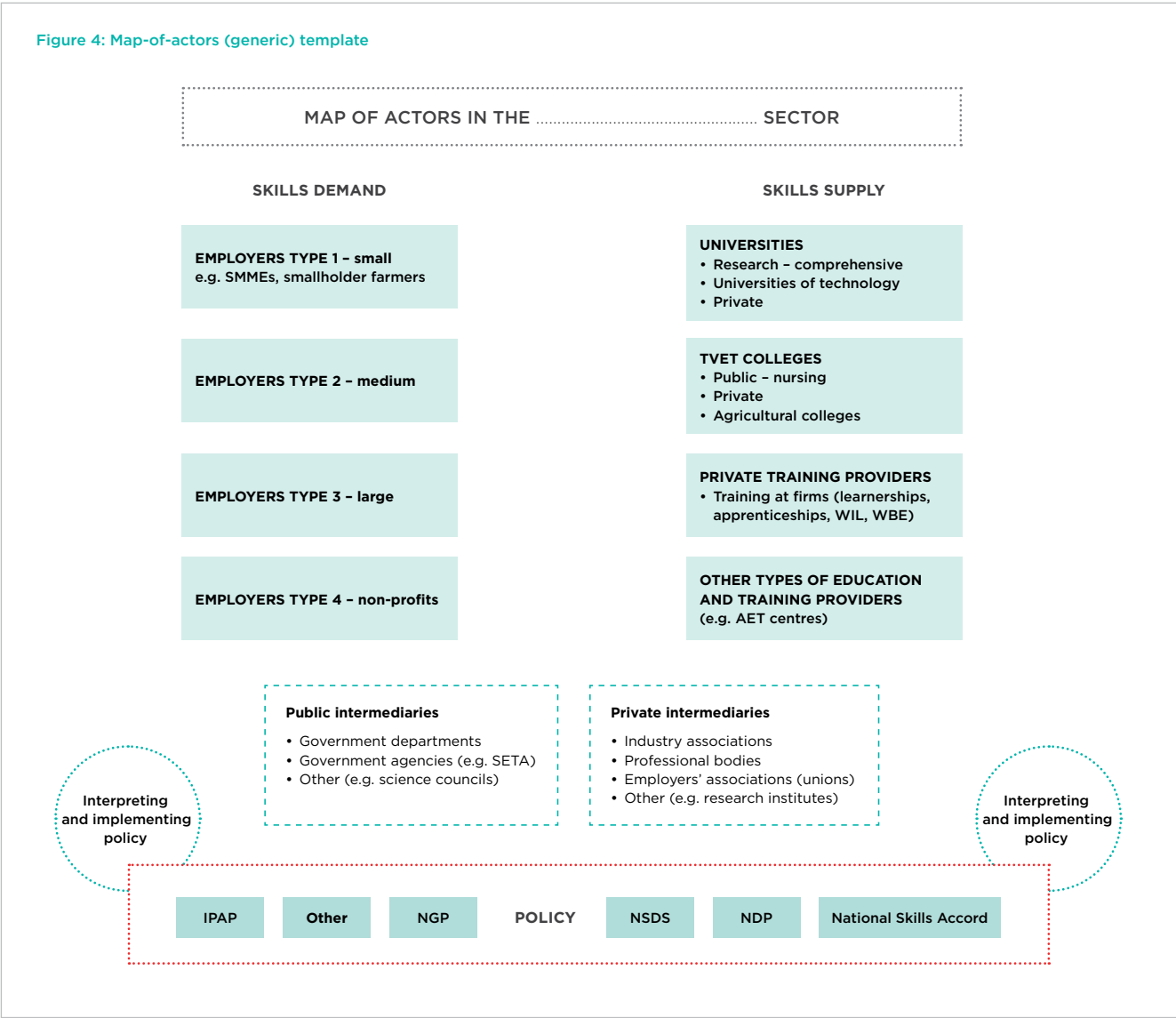
STEP-BY-STEP GUIDE 1: Analysing the role of key role players in a (sub)sector

STEP	ACTION	SUGGESTED SOURCE	SUGGESTED METHODS	TEMPLATE/GUIDE
1	Develop profiles for skills demand, skills supply, and the main sectoral intermediaries in the sector	• SETA documents (e.g. WSPs, SSPs) • SETA subsector committees/constituencies • Industry associations • Government departments and agencies	• Desktop research • Interviews	Figure 3: Research questions on skills demand, skills supply and intermediary organisations
2	Draw a visual map of actors in the (sub)sector	List of main actors from STEP 1		Map-of-actors template (Figure 4); Appendix 1
3	Analyse the roles of key role players	• Map of actors (from STEP 2) • SETA documents • Other documents, Internet resources • SETA subsector committees/constituencies • Industry associations	• Desktop research • Interviews	Figure 3: Research questions on skills demand, skills supply, intermediary organisations, and key role players

Notes:

- As a systemic mapping exercise, the focus should be on defining and describing actors and their relationships.
- This must also be quantified where possible (e.g. 700 SMMEs, 55 merSETA-accredited private providers, etc.).

SECTION 3 Mapping the actors in a sectoral skills development system



SECTION

4

Mapping sector partnerships

How can sector education and training authorities (SETAs) collect and analyse data on partnerships in a skills development system in order to identify and monitor key SETA partnerships?

Understanding with whom SETAs work, and how SETAs work with others involved in skills development systems, is crucial for identifying ways to improve SETA performance. In Section 4, we provide guidelines for measuring the extent to which SETAs partner with other organisations in their sectors/subsectors/constituencies for carrying out their mandate.

Figure 5 suggests key research questions for identifying and monitoring existing partnerships in a sector. We propose three stages in order to produce the kind of analysis required in the new SSP framework – that is, analysis that goes beyond presenting a ‘shopping list’

of partnerships and beyond simple description. We provide tried-and-tested instruments for collecting and analysing data on sector partnerships.

The questionnaire template for collecting data on partnerships can be incorporated into existing SETA surveys so as to identify important partnerships among the key role players; or the questions could be added to the workplace skills plan (WSP) template – for example, the firms could be asked to list the education and training providers they have used and the frequency of interaction with these providers; or the research could be part of a separate research exercise.

How to collect data on sector partnerships *Research methods*

Gathering data on the state of existing partnerships

- Survey on the existence and frequency of interaction
- Target audience: SETA managers and key role players (which may include managers at firms, other sectoral intermediaries and PSET organisations)

Gathering data on the nature of existing partnerships and for improving partnerships

- Semi-structured interviews with SETA managers
- Semi-structured interviews with key role players (which may include managers at firms, other sectoral intermediaries, and PSET organisations identified in the sector profile)

SECTION 4 Mapping sector partnerships

Figure 5: Outline for mapping sector partnerships in a sectoral skills development system



STEP-BY-STEP GUIDE 2: Analysing sector partnerships

STEP	ACTION	SUGGESTED SOURCE	SUGGESTED METHODS	TEMPLATE/GUIDE
1	Develop network analysis questionnaire	Map of actors created for the sector profile		Network analysis questionnaire template; Appendix 2
2	Administer the questionnaire	• Relevant managers at SETAs, such as subsector committee managers • Managers at firms and PSET organisations	• Interviews • Online/email survey • Survey administered at subsector committee meetings	Survey template: Questionnaire on sector partnerships
3	Capture the data and prepare the data file			• Step-by-step guide 3 • Table 1
4	Analyse the data and draw the network diagrams	Dataset in Excel	• Network analysis using network analysis software and/or • Network analysis using Excel or another data analysis program	• Figure 5 • Step-by-step guide 4 • Boxes 1 to 3
5	Create and analyse the data on the main goal and deliverable of each partnership	Data in Excel	Categorise data using thematic coding	Partnership matrix template (Table 3)
6	Incorporate analyses in steps 5 and 6 into the narrative report			• Figure 5 • The sector skills plan framework (2011–2016)

Survey template: Questionnaire on sector partnerships

A template of a questionnaire on sector partnerships is provided below. The questionnaire can be administered in an online format (using SurveyMonkey.com, for example), via e-mail, telephonically, or face to face as part of semi-structured

interviews. There are pros and cons to each of these methods of data collection. We recommend the latter method (semi-structured interviews), as it provides an opportunity to discuss and clarify the questions with respondents. The questionnaire can also be a useful interviewing tool that serves to guide

the discussion on partnerships. On the other hand, the online survey format is the least time-consuming and most suitable for busy managers at SETAs and other organisations. Also, the data is captured automatically into a data file, but it may not be in a format suitable for the analysis.

Questionnaire on sector partnerships							
To what extent do you interact with any of these external actors in order to inform your skills development activities, specifically in relation to the sector? Also indicate the main goal, deliverable, and due date for the main deliverable of each partnership.							
Position in the organisation: _____							
	Not at all	Isolated instances	On a moderate scale	On a wide scale	Main goal of the partnership	Main deliverable of the partnership	Due date for deliverable
External social actors	1	2	3	4			
List all of the key role players in skills development in the sector. A sample questionnaire is provided in the Appendix.	☐	☐	☐	☐			

Preparing the data file

STEP-BY-STEP GUIDE 3: Preparing the sector partnerships data file for analysis

1	CREATE A DATA FILE	2	ENTER DATA	3	CLEAN UP DATA FILE
• A template for capturing the data is provided on page 13. • The data can be captured in Excel or any other data analysis program.		• Use shortened versions of organisation names. • Ensure uniformity in entering organisation names in order to avoid errors. • There should be no additional spaces before or after the organisation name that is entered. • Capital letters should be used consistently so as to avoid errors. • Double-check data entered in order to ensure accuracy. • Save the master copy.		• Create a copy of the master data file. • Use the copy of the master file. • Calculate average frequency for duplicate partnerships with different frequencies of interaction. • Use the average frequencies and delete duplicates. • Check for errors in entering organisation names; there should be no additional spaces before or after the name. • Double-check data entered in order to ensure accuracy. • Save a copy. • Create a copy of the cleaned-up version for the analysis in order to safeguard changes made to the master file.	

SECTION 4 Mapping sector partnerships

Table 2: Data file template						
Participant's position	Organisation	Partner organisation	Frequency of interaction	Main goal of the partnership	Main deliverable of the partnership	Due date
Training manager	UCL	AgriSETA	3	Develop a farm management short course that meets AgriSETA's accreditation standards	AgriSETA-accredited short course	25 October 2014
Identifying information for record purposes.	These three data columns will be used in the network analysis.			Categorise and record data on the main goal and deliverable of the partnership in the partnership matrix, and the tables provided in Analytical template: Strategies and mechanisms for meeting skills needs.		

- Notes:**
- Frequency of interaction is measured on a scale from 1 to 4 – that is, from 'Not at all' to 'On a wide scale' (see the survey template on page 12).
 - The data columns are grouped according to purpose, which reduces time spent preparing the data file for analysis.
 - The entries are included as examples.

Interviews on the nature of existing partnerships and for improving partnerships

Figure 5 suggests research questions for gathering information on the nature of existing sector partnerships and for identifying ways to strengthen partnerships. These research questions can be used as a guide for developing interview questions. The questionnaire on partnerships can also be useful as an interview tool. Interviewees can be asked to elaborate on the nature of partnerships, including:

- Why the partnership was formed (for identifying important mechanisms to be promoted);
- Facilitators for, and obstacles to, sustaining the partnership;
- Suggestions for strengthening the partnership; and

- Partnerships needed for addressing specific skills development needs.

How to analyse the data on sector partnerships

Analysing the questionnaire data

The questionnaire data can be analysed using network analysis software and/or Excel, or any other data analysis package. There are pros and cons to both, as shown in Figure 6. Ideally, both methods should be used to provide complementary maps and statistics.

The data can be used to draw a visual network map showing the relative strength of existing partnerships. The maps can be drawn using network analysis software and/or manually in Excel or MS Word.

Using network analysis software

Some software packages, like Pajek, are open access and can be downloaded easily. The Pajek software and user manual can be downloaded from <http://vlado.fmf.uni-lj.si/pub/networks/pajek/>.

The most common social network analysis statistics that are useful for addressing the research questions include degree centrality, closeness centrality and betweenness centrality. Degree centrality refers to the number of partnerships in which each organisation is involved.⁸ Degree and closeness centrality indicates how easily information can reach each an organisation in the network. Betweenness centrality identifies organisations acting as intermediaries in facilitating interaction and information flows and thus provides

⁸ De Nooy et al. (2011).

information about how crucial an organisation is to the transmission of information through the skills development system.⁹ Since intermediaries tend to be influential in their networks, partnering with them is a useful strategy for increasing the reach of, and strengthening, interventions. It is thus essential for a SETA to know which of the key role players in its sector act as intermediaries.

Network analysis without the use of network analysis software

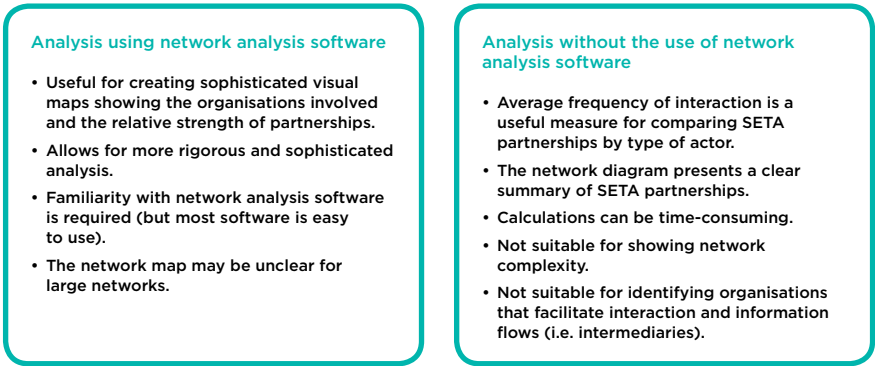
We propose a calculation of the average frequency of interaction per type of actor (e.g. firm, university, TVET college, private provider, or sectoral intermediary): calculate the product of the number of partnerships and their relative strengths and divide by the total number of partnerships. Step-by-step guide 4 shows how the average frequency of interaction was calculated for the group of firms in a skills development network.

In the boxes on pages 15, 16 and 17, we present an analysis of merSETA's partnership networks in the automotive components manufacturing sectoral system of innovation in the Eastern Cape. The analysis shows the different kinds of information obtained through the different methods of analysis described in this section. The analysis is drawn from a report, Understanding interactive capabilities for skills development in sectoral systems of innovation: A case study of the Tier 1 automotive component sector in the Eastern Cape, prepared as part of the LMIP research project.¹⁰

⁹ De Nooy et al. (2011).

¹⁰ See McGrath (2014).

Figure 6: Pros and cons of different methods for analysing the questionnaire data



STEP-BY-STEP GUIDE 4: Calculating average frequency of interaction – among firms, as an example

A	FREQUENCY WEIGHT	B	NUMBER OF PARTNERSHIPS	C	CALCULATION (B × A)
	2		4		8
	3		12		36
	4		20		80
Grand total			36		124
Average frequency of interaction for firms (= C/B)					3.444

SECTION 4 Mapping sector partnerships

BOX 1

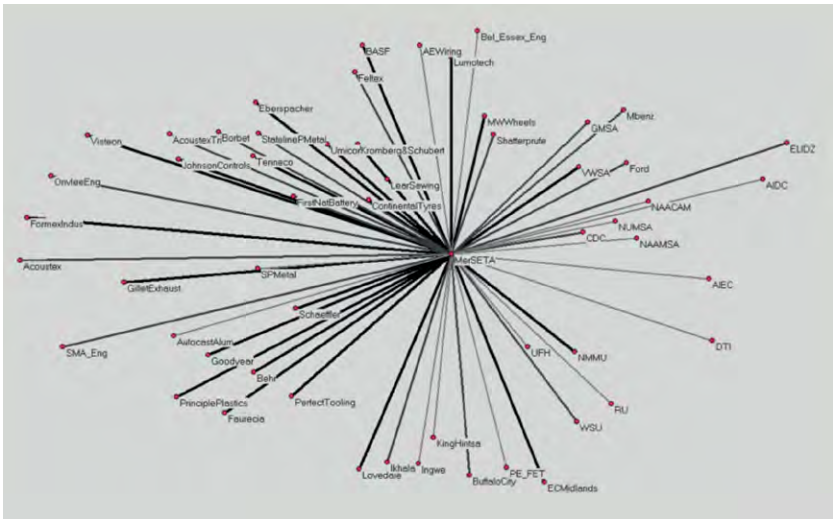
Network analysis of merSETA's partnerships using network analysis software

An analysis of merSETA's partnership networks in the automotive components manufacturing sectoral system of innovation

Three staff members at merSETA completed a network analysis questionnaire in November and December 2014. We integrated the data, using the average frequency of interaction for duplicate partnerships, as stipulated in Step-by-step guide 3. We found that merSETA staff reported 55 partnerships with a range of types of organisations, including 36 firms, 8 intermediary organisations, 7 public TVET colleges and 4 universities in the Eastern Cape. These partnerships varied in strength, measured as frequency of interaction.

Figure 7 illustrates the network map of merSETA partnerships. The map shows the names of the partners and the strength of each interaction.

Figure 7: MerSETA partnership network in the automotive subsector drawn in Pajek



Source: LMIP project data

It can be seen in Figure 7 that merSETA interacts on a wide scale with most firms in the subsector and on a considerably lower scale with other sectoral intermediaries, with the strongest relations involving the industrial development zone intermediaries (Coega Development Corporation (CDC) and the East London Industrial Development Zone (ELIDZ)). While merSETA reports interaction with almost all of the public TVET colleges and all of the public universities in the province, these relations vary in strength, with most of the interaction with the public TVET colleges reported to occur in isolated instances or on a moderate scale. These findings point to SETA partnerships that could be strengthened and new partnerships that may improve the SETA's performance in the subsector.

Note:
The thickness of the line corresponds to the strength of the partnership, such that the thicker the line, the higher the frequency of interaction and thus the stronger the partnership.

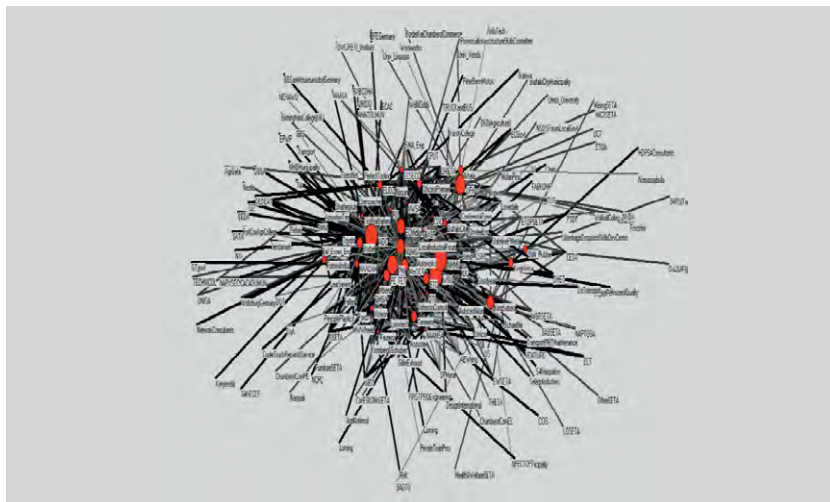
BOX 2

Network analysis of the automotive components manufacturing skills development network using network analysis software

We administered the same questionnaire used to collect the data analysed in Box 1, to key people at Tier 1 firms, sectoral intermediary organisations, universities, public TVET colleges and private training providers in the Eastern Cape. This allowed us to obtain data on more of the partners involved in skills development in the subsector in the Eastern Cape in order to get a better sense of the role that merSETA plays in this network. Again, we integrated the data into one dataset and calculated the average frequency of interaction for duplicate scores. We analysed the data using Pajek. The results are illustrated in Figure 8.

We used the most common network analysis statistics to analyse the network, namely degree centrality, closeness centrality and betweenness centrality. The results point to key role players in skills development with whom merSETA could partner in order to improve skills training, and to areas where merSETA could intervene to bring key organisations into the network. The results show that two universities are the most well connected in the network, namely NMMU and WSU. These two universities are the key players in the

Figure 8: Network map of the wider automotive subsector skills development network drawn in Pajek



Source: LMIP project data; McGrath (2014)

Notes:

- The thickness of the line corresponds to the strength of the partnership, such that the thicker the line, the higher the frequency of interaction and thus the stronger the partnership.
- The size of the circles corresponds to the extent to which the actors link other actors and channel information flows.

network. Two private training providers (Eastcape Training Centre and PMI) and public TVET colleges (East Cape Midlands and Port Elizabeth) appear in the top ten organisations with the highest number of partnerships. These six organisations are also key intermediaries. However, the most important intermediary actor in this skills development network is the AIDC, which is also amongst the top three with regard to the number and strength of the partnerships. Of the public TVET colleges, Buffalo City

FET College has a third fewer connections than either the East Cape Midlands or Port Elizabeth FET colleges, reflecting its location in the less densely networked East London area. MerSETA appears in the top five for number and closeness of partnerships, but lies eighth as an intermediary actor, indicating that the SETA could strengthen its role in linking organisations and groups of organisations so as to improve skills development in the subsector.

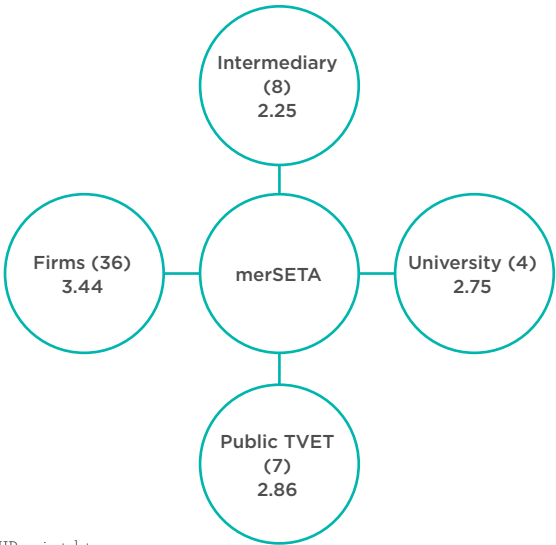
SECTION 4 Mapping sector partnerships

BOX 3

Network analysis of the automotive components manufacturing skills development network without the use of network analysis software

An alternative way to represent merSETA's partnerships in relation to skills development in the automotive components manufacturing subsector visually is to use the SmartArt function in MS Word or Excel. Figure 9 illustrates merSETA's partnerships in the subsector, using the same data employed to draw the network diagram in Box 1. Since calculating centrality statistics requires network analysis software, we use alternative statistics, namely average frequency of interaction per type of organisation (see Step-by-step guide 4).

Figure 9: 'Hand-drawn' network map of merSETA's partnership network in the automotive subsector



Source: LMIP project data

Notes:

The number of partnerships with each type of actor is shown in brackets.

It can be seen that, in the automotive components manufacturing sectoral system of innovation in the Eastern Cape, merSETA's strongest relations are with firms and its weakest relations are with sectoral intermediaries. MerSETA staff reported that, on average, they interact with firms in the subsector on a moderate to wide scale (average frequency = 3.44), and with sectoral intermediaries, on average, in isolated instances (average frequency = 2.25). Considering that sectoral intermediaries tend to be important intermediaries, the SETA could benefit from strengthening interaction with this group of organisations. While merSETA interacts with all of the public universities in the province on a moderate scale, it interacts with seven of the eight public TVET colleges. Why interaction was not reported with one of the colleges could be investigated further.

Monitoring partnerships: Partnership matrix

Use the information obtained via the network analysis questionnaire to complete a partnership matrix. Table 3 presents a template for the matrix. To facilitate the analysis, we suggest that the data on individual partnerships – for example, merSETA interacts with Shatterprufe on a wide scale (frequency = 4) – be grouped by type of actor – for example, SETA interacts with FIRM (frequency = 4).

Table 3: Partnership matrix template					
	Partner type A (e.g. firms)	Partner type B (e.g. SETAs)	Partner type C (e.g. public universities)	Partner type D (e.g. public TVET colleges)	Etc.
Partner type A (e.g. small employers)	-----	INSERT number of partnerships INSERT partnership goals	INSERT number of partnerships INSERT partnership goals	INSERT number of partnerships INSERT partnership goals	INSERT number of partnerships INSERT partnership goals
Partner type B (e.g. SETAs)	INSERT number of partnerships INSERT partnership goals	-----	INSERT number of partnerships INSERT partnership goals	INSERT number of partnerships INSERT partnership goals	INSERT number of partnerships INSERT partnership goals
Partner type C (e.g. public universities)	INSERT number of partnerships INSERT partnership goals	INSERT number of partnerships INSERT partnership goals	-----	-----	INSERT number of partnerships INSERT partnership goals
Partner type D (e.g. public TVET colleges)	INSERT number of partnerships INSERT partnership goals	INSERT number of partnerships INSERT partnership goals	INSERT number of partnerships INSERT partnership goals	-----	INSERT number of partnerships INSERT partnership goals
Etc.	INSERT number of partnerships INSERT partnership goals	INSERT number of partnerships INSERT partnership goals	INSERT number of partnerships INSERT partnership goals	INSERT number of partnerships INSERT partnership goals	INSERT number of partnerships INSERT partnership goals

SECTION 4 Mapping sector partnerships

Analytical template: State of partnerships and networks

Use the information obtained via the network analysis questionnaire and interviews to complete the tables below, which serve as a resource for further analysis on partnerships in a skills development system. These tables can be used to describe and monitor partnerships.

1. What are the main deliverables of the SETA's partnerships with the actors listed below?

Type of actor	Main kinds of deliverables
e.g. small employers	
e.g. SETAs	
e.g. TVET colleges	

2. Which are the strongest partnerships, based on frequency of interaction?

Actor	Frequency of interaction	Goal of partnership	Has the partnership been successful in delivering on partnership goals?	Should this kind of partnership be replicated? If yes, why? If no, why not?
e.g. employer: Shatterprufe				
e.g. SETA: merSETA				

3. Which are the weakest partnerships, based on frequency of interaction?

Actor	Frequency of interaction	Goal of partnership	Has the partnership been successful in delivering on partnership goals?	Should this kind of partnership be replicated? If yes, why? If no, why not?
e.g. employer: Shatterprufe				
e.g. SETA: merSETA				

4. Which actors or partnerships are important for skills development, but are absent from the networks?

Actor/partnership	Why would this actor/partnership be useful for skills development in the (sub)sector/constituency?	Should this the partnership be pursued? Why?
e.g. actor: TVET college		
e.g. partnership: University-TVET college		

Analytical template: Strategies and mechanisms for meeting skills needs

Use the information obtained via the network analysis questionnaire, ‘Main goal of the partnership’, to identify the main strategies and mechanisms used for supporting skills development in partnership with others. This information will be useful for identifying effective strategies and mechanisms to promote future partnerships.

1. Which *internal interface* mechanisms/strategies does the SETA use for supporting skills development in the sector?

Strategy/mechanism	Describe the nature and reach of the mechanism
List of the strategies/mechanisms (e.g. training programmes/centres at the intermediary)	

2. Which *external interface mechanisms/strategies* does the SETA use for supporting skills development in the sector?

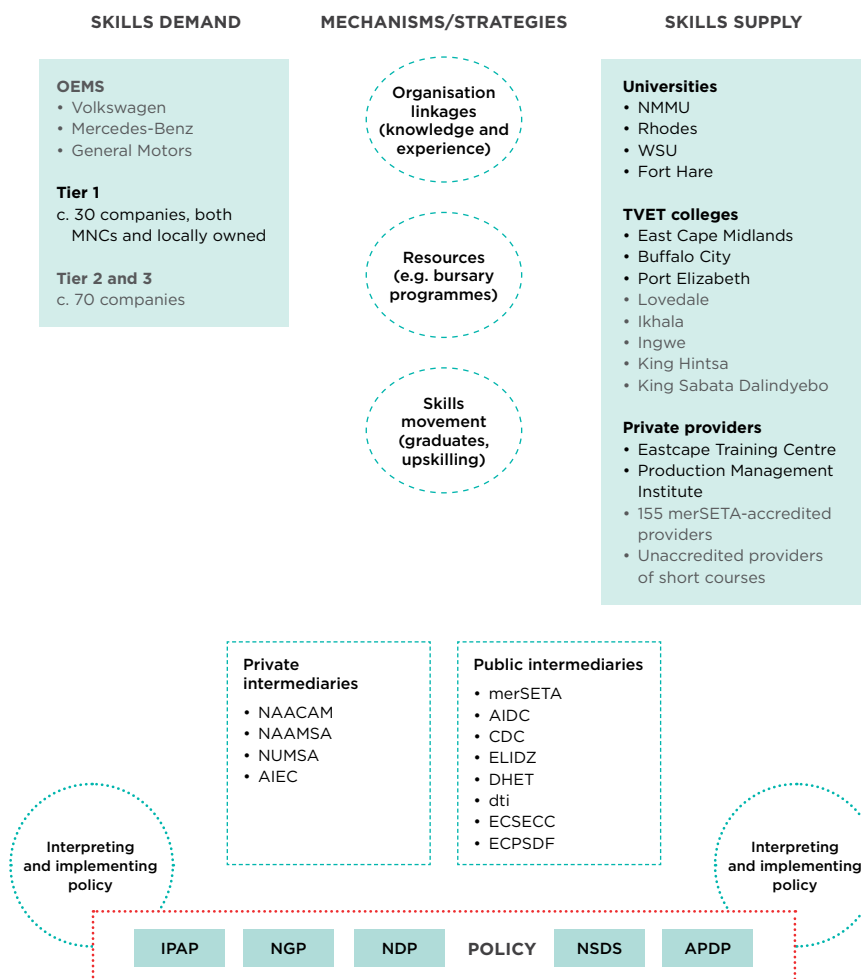
Strategy/mechanism	Describe the nature and reach of the mechanism
Knowledge support and provision of resources:	
List the strategies/mechanisms used (e.g. transferring specialised knowledge, funding, etc.)	
Initiating and supporting interorganisational networks:	
List the strategies/mechanisms (e.g. supporting the setting up of cooperative training programmes)	
Other – specify	

This section provided step-by-step guides for collecting and analysing data on SETA partnerships –specifically, with whom SETAs and other actors in the skills development system interact, how often, and for what reason. The research tools can be used to monitor the effectiveness of partnerships in achieving the intended goals and deliverables. The kind of analysis suggested also provides insight into how the SETA is inserted into a sectoral skills development system, as well as into weaknesses in the system that require intervention.

APPENDICES

Appendix 1: Sample map of actors

Figure 10: Map of a sectoral system of innovation: The automotive components manufacturing sectoral system of innovation in the Eastern Cape



Note: the organisations in grey are not a core part of this study but are actors in the SSL.

Appendix 2: Extract from a sample network analysis questionnaire

SCHEDULE 4: Network analysis schedule – interaction in the sugar skills development system

To what extent do you interact with any of these external actors in order to inform your skills development activities, specifically in relation to the sugar sector? Also indicate the main goal, deliverable, and due date for the main deliverable of each partnership.

Position in the organisation:

	External social actors	Not at all	Isolated instances	On a moderate scale	On a wide scale	Main goal of the partnership	Main deliverable of the partnership	Due date of deliverable
		1	2	3	4			
	SETAs							
1	AgriSETA	☐	☐	☐	☐			
2	merSETA	☐	☐	☐	☐			
	Other SETAs (specify):	☐	☐	☐	☐			
3		☐	☐	☐	☐			
	Private intermediaries							
4	South African Sugar Association Council (umbrella organisation)	☐	☐	☐	☐			
5	South African Cane Growers' Association	☐	☐	☐	☐			
6	Local grower councils	☐	☐	☐	☐			
7	South African Sugar Millers' Association Limited	☐	☐	☐	☐			
8	South African Sugarcane Research Institute	☐	☐	☐	☐			
9	Sugar Milling Research Institute	☐	☐	☐	☐			
	Other sectoral intermediaries (specify):							
12		☐	☐	☐	☐			
	Universities							
13	University of KwaZulu-Natal	☐	☐	☐	☐			
14	University of Zululand	☐	☐	☐	☐			
15	Mangosuthu University of Technology	☐	☐	☐	☐			

APPENDICES

Appendix 3: References and further reading

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